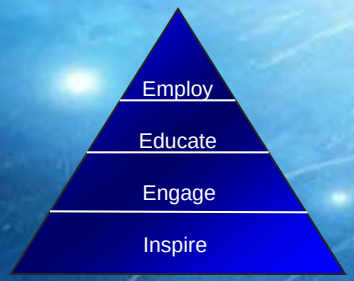
National Aeronautics and Space Administration

Education at NASA



Dr. Joyce L. Winterton
Assistant Administrator for Education


The nation that
out-educates us today
will out-compete us
tomorrow.
- President Barack Obama
Speech to the National Academy of Science
April 27, 2009

US Global Rank on Science

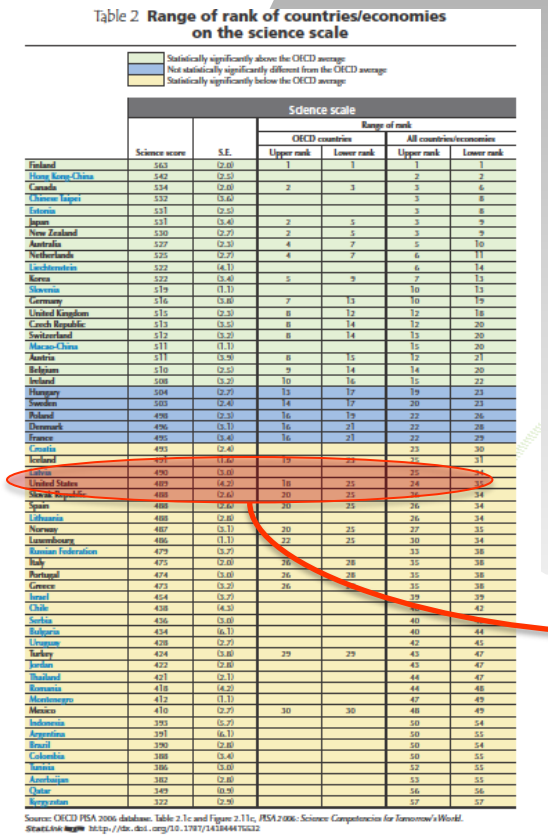


Table 2 **Range of rank of countries/economies on the science scale**

Statistically significantly above the OECD average
Not statistically significantly different from the OECD average
Statistically significantly below the OECD average

	Science scale					
			Range of rank			
			OECD countries		All countries/economies	
	Science score	S.E.	Upper rank	Lower rank	Upper rank	Lower rank
Finland	563	(2.0)	1	1	1	1
Hong Kong-China	542	(2.5)			2	2
Canada	534	(2.0)	2	3	3	6
Chinese Taipei	532	(3.6)			3	8
Estonia	531	(2.5)			3	8
Japan	531	(3.4)	2	5	3	9
New Zealand	530	(2.7)	2	5	3	9
Australia	527	(2.3)	4	7	5	10
Netherlands	525	(2.7)	4	7	6	11
Liechtenstein	522	(4.1)			6	14
Korea	522	(3.4)	5	9	7	13
Slovenia	519	(1.1)			10	13
Germany	516	(3.8)	7	13	10	19
United Kingdom	515	(2.3)	8	12	12	18
Czech Republic	513	(3.5)	8	14	12	20
Switzerland	512	(3.2)	8	14	13	20
Macao-China	511	(1.1)			15	20
Austria	511	(3.9)	8	15	12	21
Belgium	510	(2.5)	9	14	14	20
Ireland	508	(3.2)	10	16	15	22
Hungary	504	(2.7)	13	17	19	23
Sweden	503	(2.4)	14	17	20	23
Poland	498	(2.3)	16	19	22	26
Denmark	496	(3.1)	16	21	22	28
France	495	(3.4)	16	21	22	29
Croatia	493	(2.4)			23	30
Iceland	491	(1.6)	19	25	25	31
Latvia	490	(3.0)			25	31
United States	489	(4.2)	18	25	24	32
Slovak Republic	488	(2.6)	20	25	26	34
Spain	488	(2.6)	20	25	26	34
Lithuania	488	(2.8)			26	34
Norway	487	(3.1)	20	25	27	35
Luxembourg	486	(1.1)	22	25	30	34
Russian Federation	479	(3.7)			33	38
Italy	475	(2.0)	26	28	35	38
Portugal	474	(3.0)	26	28	35	38
Greece	473	(3.2)	26	28	35	38
Israel	454	(3.7)			39	39
Chile	438	(4.3)			40	42
Serbia	436	(3.0)			40	44
Bulgaria	434	(6.1)			40	44
Uruguay	428	(2.7)			42	45
Turkey	424	(3.8)	29	29	43	47
Jordan	422	(2.8)			43	47
Thailand	421	(2.1)			44	47
Romania	418	(4.2)			44	48
Montenegro	412	(1.1)			47	49
Mexico	410	(2.7)	30	30	48	49
Indonesia	393	(5.7)			50	54
Argentina	391	(6.1)			50	55
Brazil	390	(2.8)			50	54
Colombia	388	(3.4)			50	55
Tunisia	386	(3.0)			52	55
Azerbaijan	382	(2.8)			53	55
Qatar	349	(0.9)			56	56
Kyrgyzstan	322	(2.9)			57	57

Source: OECD PISA 2006 database. Table 2.1c and Figure 2.11c, *PISA 2006: Science Competencies for Tomorrow's World*.
StatLink http://dx.doi.org/10.1787/141844475532

1. **Finland**
2. **Hong Kong**
3. **Canada**
4. **Chinese Taipei**
5. **Estonia**
6. **Japan**

11. **Korea**
12. **Slovenia**
13. **Germany**
14. **United Kingdom**

26. **Croatia**
28. **Latvia**

29. United States

Source: OECD 2007 Executive Summary PISA 2006: Science Competencies for Tomorrow's World

National Education Administration and Congressional Priorities

Educate the next generation with 21st century knowledge and skills while creating a world-class workforce. **(Executive Office of the President, Strategies for American Innovation , September 2009)**

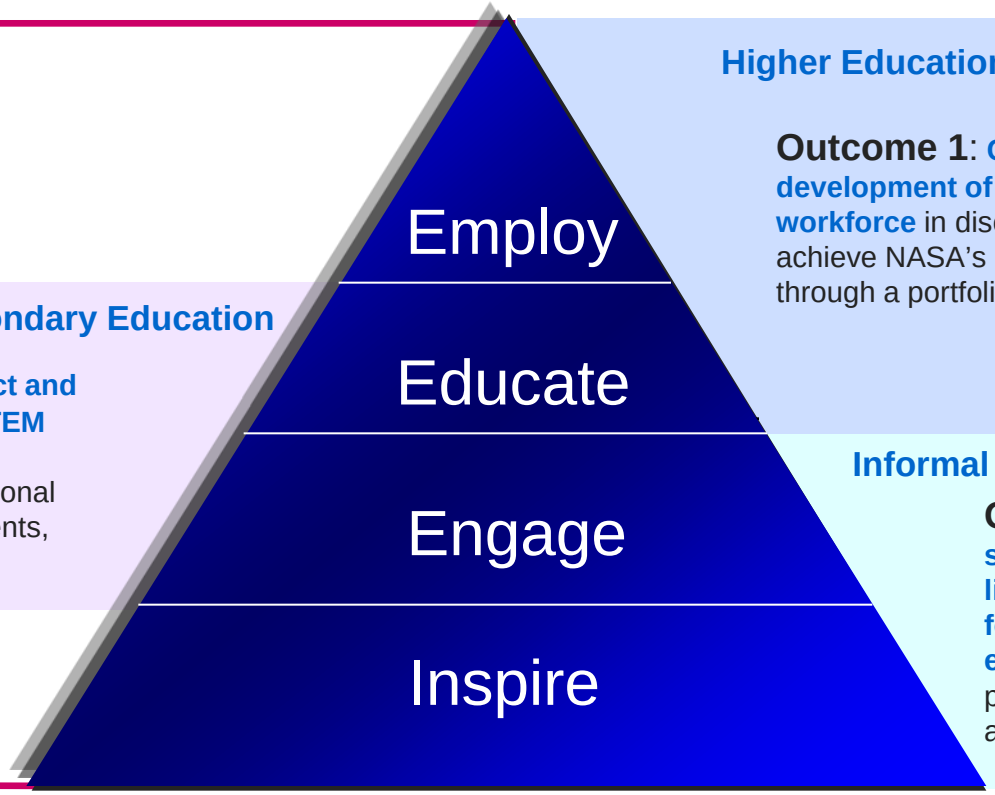
- Quantity , quality and diversity of math and science teachers
- Students prepared for STEM related careers
- Educational opportunities for women and minorities – White House Council on Women and Girls
- Expand access to higher education and training
- Fellowships and interdisciplinary graduate programs
- Supporting future entrepreneurs
- Scientific innovation

"It is the sense of Congress that NASA's educational programs are important sources of inspiration and hands-on learning for the next generation of engineers and scientists and should be supported."
(H.R. 6063 NASA Authorization Act of 2008)

NASA Education Overview

Strategic Framework

Cultivate Diversity of Workforce Disciplines and Practitioners



Higher Education

Outcome 1: **Contribute to the development of the STEM workforce** in disciplines needed to achieve NASA's strategic goals, through a portfolio of investments.

Elementary/ Secondary Education

Outcome 2: **Attract and retain students in STEM disciplines** through a progression of educational opportunities for students, teachers and faculty.

Informal Education

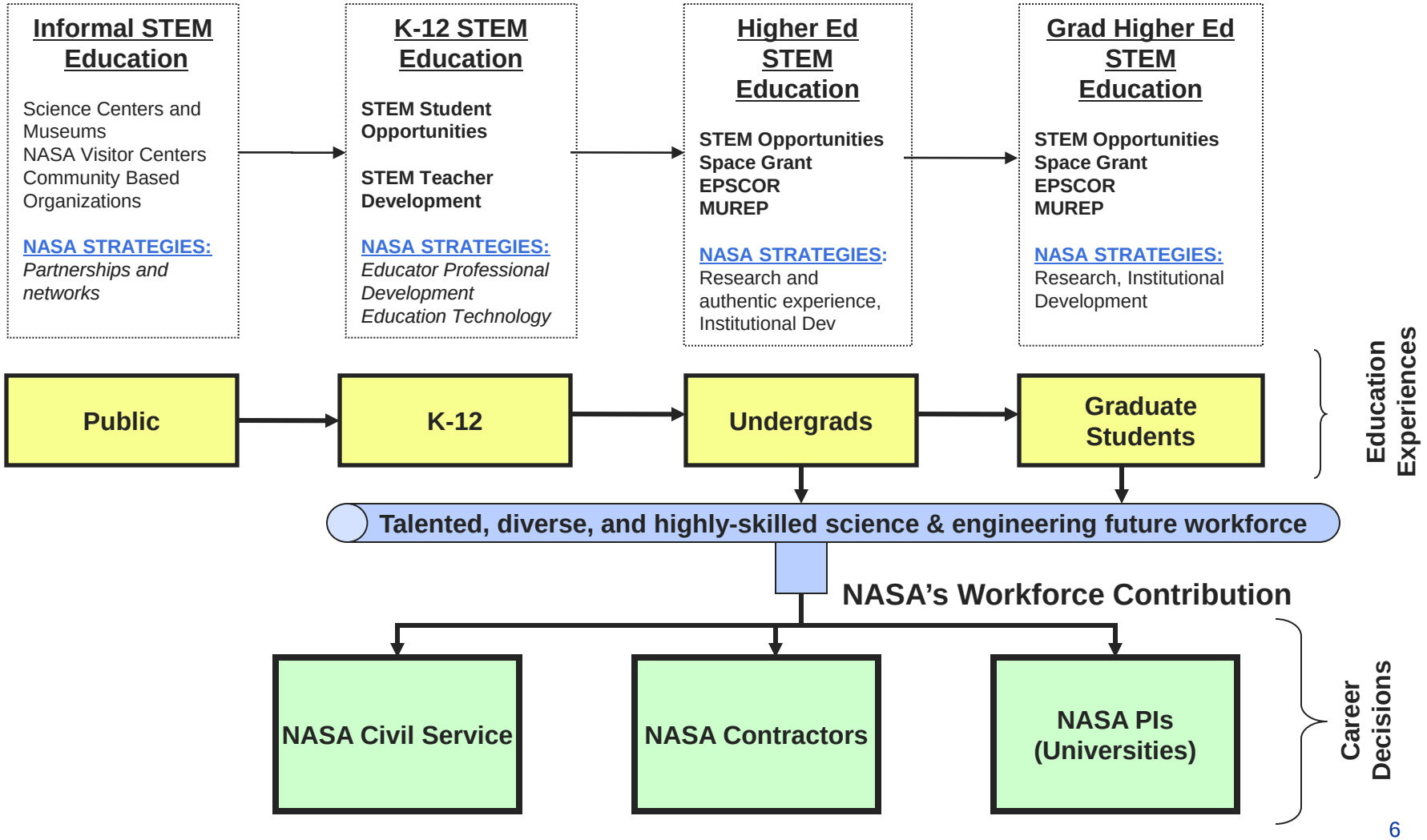
Outcome 3: **Build strategic partnerships and linkages between STEM formal and informal education providers** that promote STEM literacy and awareness of NASA's mission.

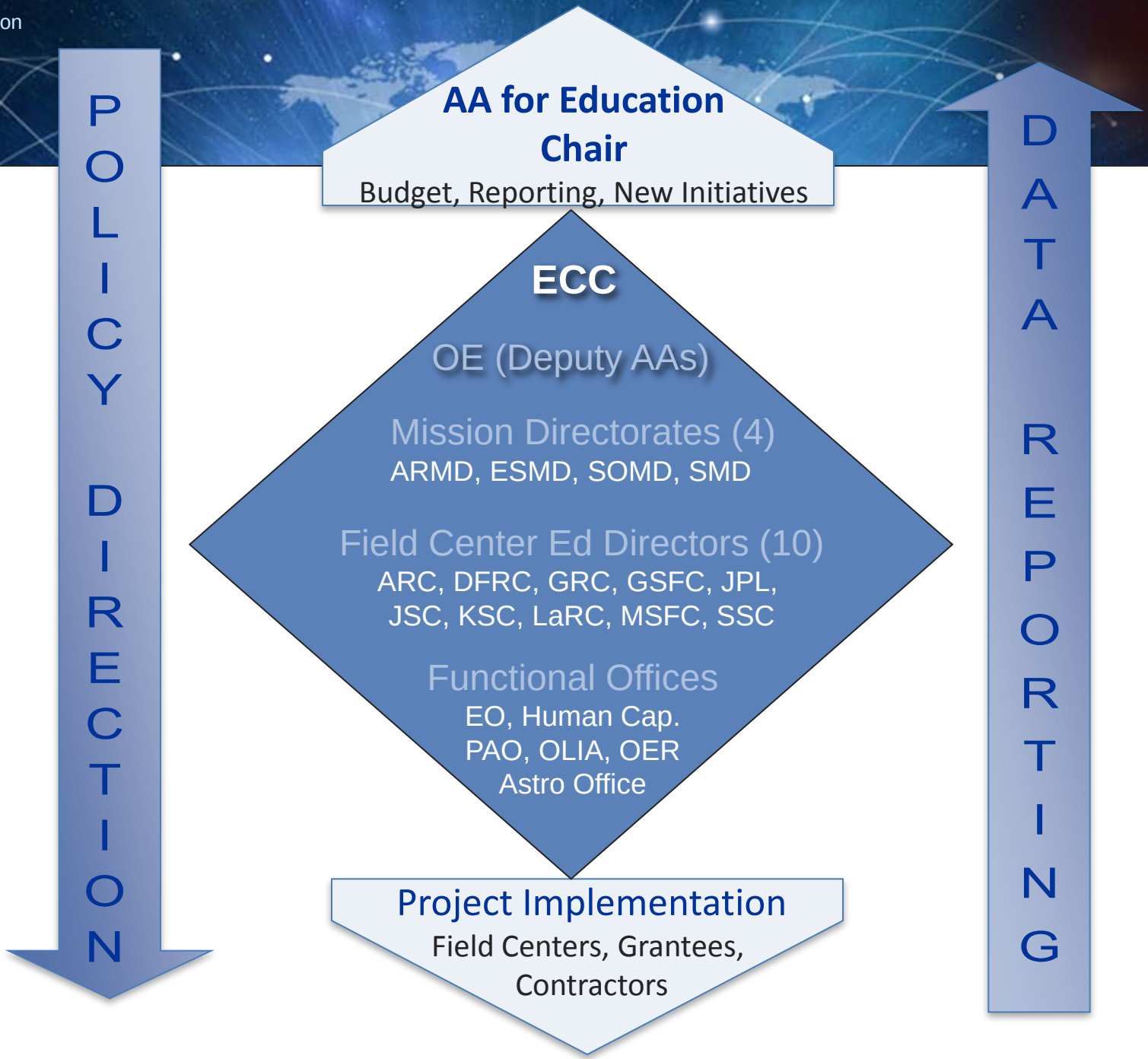
Principles/ Criteria

Relevance	NASA Content	Diversity	Evaluation	Continuity	Partnerships/ Sustainability

* Science, Technology, Engineering and Mathematics (STEM)

NASA Education Opportunities




POLICY DIRECTION
AA for Education
Chair
Budget, Reporting, New Initiatives
ECC
OE (Deputy AAs)
Mission Directorates (4)
ARMD, ESMD, SOMD, SMD
Field Center Ed Directors (10)
ARC, DFRC, GRC, GSFC, JPL,
JSC, KSC, LaRC, MSFC, SSC
Functional Offices
EO, Human Cap.
PAO, OLIA, OER
Astro Office
Project Implementation
Field Centers, Grantees,
Contractors
DATA REPORTING

First Steps to a STEM Career

2009 Performance and Recent Highlights/Results

51% of Higher Education students are employed by NASA, aerospace contractors and education institutions (+27% other STEM)

83% of educators in NASA training use resources in the classroom

44% of undergraduate students move on to advanced education

1,483,362 K-12 students engaged

400+ Museums and Science Centers are actively using NASA content

FY11 Overview

- The FY 2011 budget request for Education totals $145.8 million.
- Furthers NASA's commitment to inspiring students in STEM.
- Supports Administration's STEM education teaching and learning improvement efforts, including Race to the Top and Educate to Innovate
- Continues high school, undergraduate and graduate internships/fellowships.
- Expands teacher pre-service, professional development and training programs.
- Creates new "Innovation" competitive opportunities in FY 2011
  - Innovation in Higher Ed STEM Education (to include launch opportunities)
  - Global Climate Change (to engage community colleges and minority institutions)
  - K-12 STEM Education (to include formal and informal education approaches)

Innovation in K-12 Education (NEW in FY 2011)

Competitive Grants support innovations in STEM teaching and learning through use of NASA content and resources.

Funding for proof of concept approaches, STEM education research, education technologies, widespread student engagement and education activities

- Identifies new strategies, approaches, incorporation of latest research findings
- Allows NASA to evaluate activities/efforts for future funding opportunities
- Fosters collaborative relationship between NASA and partners

Innovation in K-12 Education (NEW in FY 2011)

Summer of Innovation (piloted in FY 2010)

- Intensive STEM teaching and learning project piloted in summer 2010
  - To reach 100,000 STEM underperforming middle school students; 5,000 STEM educators
  - Students will achieve STEM proficiency and increase interest in STEM careers
- Strategically infuses NASA content in proven summer learning programs
- Awards managed by Space Grant consortia in partnership with state, district, local education systems, informal education institutions
- Aligned with goals and outcomes of “Educate to Innovate”, “Race to the Top” and “Investing in Innovation” initiatives.
- Funded with $10M of the FY 2010 Congress appropriation for competitive grants to support K-12 education

Innovation in Global Climate Change Education (NEW in FY 2011)

- Increases the participation of underrepresented and underserved students in NASA global climate change education and research
- Targets students and educators from minority serving institutions and community colleges
  - Managed through NASA's Minority University Research and Education Program (MUREP)
- Consistent with
  - Recommendations of the National Research Council's report *Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond*
  - Report of the National Academies*, Rising Above the Gathering Storm.*
- Partnerships in development include NSF, NOAA, Department of Energy

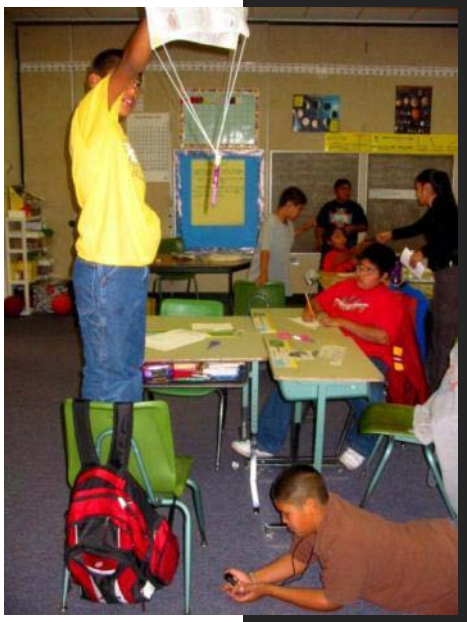
Innovation in Higher Ed STEM Education

- Increases student access to NASA mission content, flight and mission participation opportunities
- Develops the future STEM workforce
- Targeted to undergrads, graduate students, and faculty
- Will include high school to undergraduate transition activities
- Initial projects include
  - *One Stop Shopping Initiative (OSSI) for NASA Internship/Fellowship Opportunities* increases visibility of all student opportunities, streamlines application processes
  - *NASA Student Ambassadors Virtual Community* fosters interaction and mentorship among NASA interns through an interactive web-based community
  - International Space Station research opportunities

NASA Explorer School Redesign

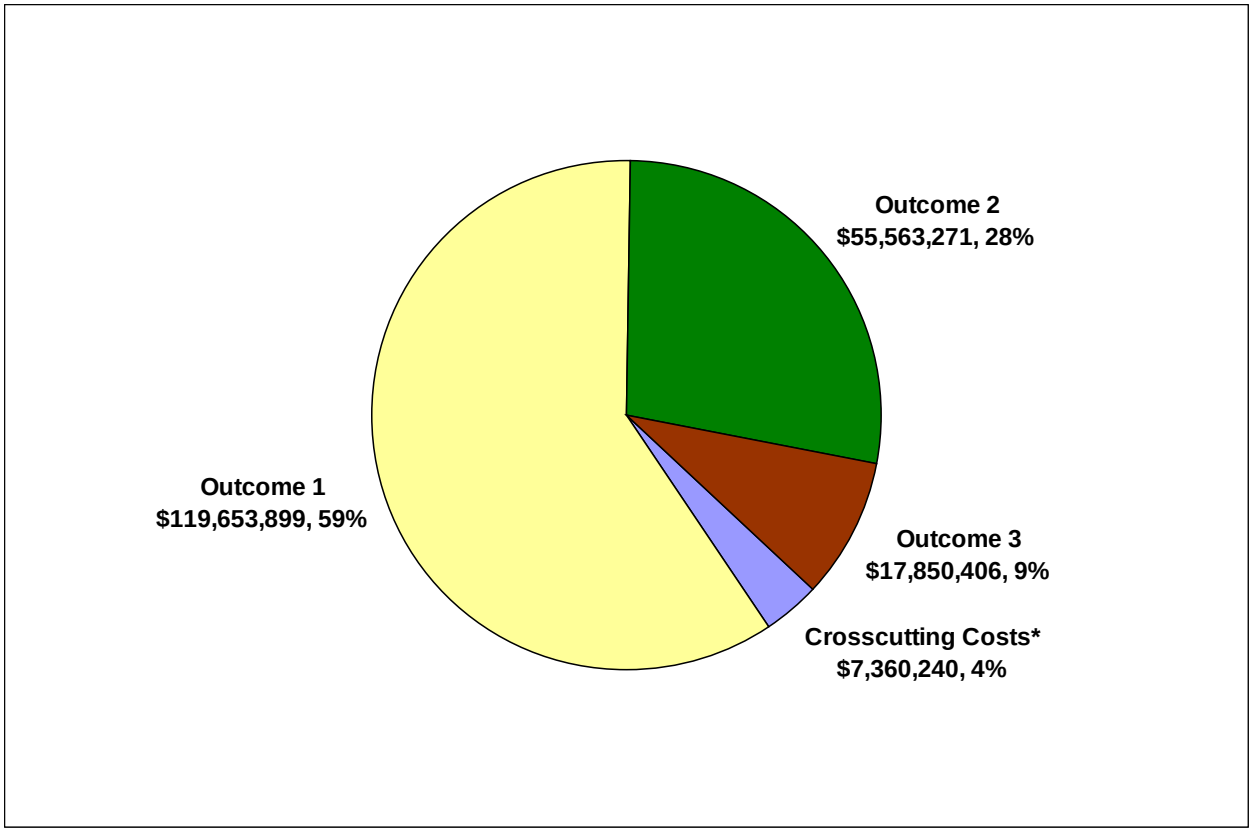
Spring 2010 Pilot

- Actively engaged schools and partners to deliver unique and authentic NASA content to middle and high school students
- Schools use measures of student involvement, increases in STEM proficiency, extracurricular activities to gain NASA incentives and awards
- Educators receive professional development and share experiences/best practices through an on-line community
- Collaborators include NSTA, ITEA, Successful Schools Network, U.S. Department of Education




Our Unique People and Missions
CAN TOUCH THE WORLD

FY09 NASA Education Funding by Outcome
Total: $200,185,816



*Crosscutting costs include conference support, liens, database development, evaluation, etc.

FY09 NASA Education Funding by Source
Total: $200,185,816